Philosophical Magazine

First Published in 1798

Physics of Condensed Matter

A Defects and Mechanical Properties

B Structural, Electronic, Optical and Magnetic Properties

Recognized by the European Physical Society

Taylor & Francis
London • Washington, DC

PHILOSOPHICAL MAGAZINE B

Editor

Professor E. A. Davis — Department of Physics and Astronomy, University of Leicester, UK

North American Editor

Dr J. L. Smith — Los Alamos National Laboratory, USA

Associate Editors

Professor D. J. Bacon — Department of Materials Science and Engineering, University of Liverpool, UK

Dr S. R. Elliott — Department of Physical Chemistry, University of Cambridge, UK

Dr M. J. Goringe *and* Dr. M. L. Jenkins — Department of Materials, University of Oxford, UK

Dr A. B. Lidiard — Department of Theoretical Chemistry, University of Oxford, UK

Dr W. M. Stobbs — Department of Materials Science and Metallurgy, University of Cambridge, UK

Regional Editors

Dr C. Ayache — Laboratoire de Cryophysique, Centre d'Études Nucléaires de Grenoble, France

Professor R. M. Bradley — Department of Physics, Colorado State University, USA

Dr D. J. H. Cockayne — Electron Microscope Unit, University of Sydney, Australia

Dr M. Duesbery — Naval Research Laboratory, Washington, USA

Professor J. D. Embury — Department of Materials Science and Engineering, McMaster University, Canada

Professor Dr E. O. Göbel — Fachbereich Physik, Philipps-Universität Marburg, Germany

Professor F. Hensel — Fach Physikalische Chemie, Philipps-Universität Marburg, Germany

Dr M. Kléman — Laboratoire de Physique des Solides, Université de Paris-Sud, France

Professor K. Morigaki — Institute of Solid State Physics, University of Tokyo, Japan

Professor C. N. R. Rao — Solid State and Structural Chemistry Unit, Bangalore, India

Professor Dr W. Schilling — Institut für Festkörperforschung der Kernforschungsanläge Jülich, Germany

Dr C. Schlenker — Laboratoire d'Études des Propriétés Électroniques des Solides, CNRS-Grenoble, France

Professor A. Seeger — Institut für Physik, Max-Planck-Institut für Metallforschung, Stuttgart, Germany

Dr V. Smid — Institute of Physics, Czechoslovak Academy of Science, Praha, Czechoslovakia

Dr R. A. Street — Palo Alto Research Center, Xerox Corporation, USA

Dr M. Tosi — Scuola Normale Superiore, Pisa, Italy

Professor U. Valdrè — Dipartimento di Fisica, Università di Bologna, Italy

Professor V. Vitek — Department of Materials Science and Engineering, University of Pennsylvania, USA

Consultant Editor

Professor Sir Nevill Mott — Cavendish Laboratory, University of Cambridge, UK

Book Review Editor

Dr E. Marseglia — Cavendish Laboratory, University of Cambridge, UK

Subscription Information

Philosophical Magazine A (*ISSN 0141 8610*) is published monthly by Taylor & Francis Ltd, 4 John Street, London WC1N 2ET, UK.

Annual Subscription 1992 £695 US$1190.

Second class postage paid at Jamaica, New York 11431. USA Postmasters: Send address changes to *Philosophical Magazine*, Publications Expediting Inc., 200 Meachan Avenue, Elmont, New York 11003. Air freight and mailing in the USA by Publications Expediting Inc., 200 Meacham Avenue, Elmont, New York 11003.

Printed in UK by Burgess Science Press, Rankine Road, Basingstoke, Hampshire RG24 0PR, UK. The paper used in this publication has a specified pH value on final manufacture of not less than 7·5 and is therefore 'acid free'.

Subscription prices includes parts A and B and Letters, none of which is available separately. Dollar rates apply to subscribers in all countries except the UK and the Republic of Ireland where the pound sterling price applies. All subscriptions are payable in advance and all rates include postage. Journals are sent by air to the USA, Canada, Mexico, India, Japan and Australasia. Subscriptions are entered on an annual basis, i.e. January to December. Payment may be made by sterling cheque, dollar cheque, international money order, National Giro, or credit card (Amex, Visa, Mastercard/Access).

Orders originating in the following territories should be sent direct to the local distributor. **Australia:** R. Hill & Son Ltd, Suite 2, 119 Gardenvale Road, Gardenvale, Victoria, 3185. **New Zealand:** R. Hill & Son Ltd, Private Bag, Newmarket, Auckland 1. **India:** Universal Subscription Agency Pvt. Ltd, 101 102 Community Centre, Malviya Nagar Extn, Post Bag No. 8, Saket, New Delhi 110017. **Japan:** Kinokuniya Company Ltd, Journal Department, PO Box 55, Chitose, Tokyo 156. **USA, Canada and Mexico:** Taylor & Francis, Inc., 1900 Frost Road, Suite 101, Bristol, Pennsylvania 19007. **UK and all other territories:** Taylor & Francis Ltd, Rankine Road, Basingstoke, Hampshire RG24 0PR.

CONTENTS OF VOL. 64 Nos 1–6

NUMBER 1—JULY

PART A

PAGE

On the electron diffraction contrast of coherently strained semiconductor layers
By D. D. Perovic, G. C. Weatherly and D. C. Houghton 1

High resolution TEM of dissociated dislocations in PbS
By A. Foitzik, P. Haasen and W. Skrotzki 29

The interaction force between the tetragonal defects and edge dislocations in the rock salt structure
By J. Soullard 39

The brittle–ductile transition in silicon
By P. B. Hirsch and S. G. Roberts 55

(100) Lattice images of GaAs and ZnSe crystals
By K. Watanabe, K. Hiratsuka and H. Yamaguchi 81

High-resolution transmission electron microscopy study of gold particles (greater than 1 nm), epitaxially grown on clean MgO microcubes
By S. Giorgio, C. Chapon, C. R. Henry, G. Nihoul and J. M. Penisson 87

Organization of defects in the first cubic approximant of the quasicrystal Al_6Li_3Cu
By P. Donnadieu 97

HRTEM of {100} platelets in natural type 1aA diamond at 1·7 Å resolution: A defect structure refinement
By J. C. Barry 111

TEM observation of the fourfold dissociation of superlattice dislocations and the determination of the fault energies in $Ni_3(Al, Ta)$
By N. Baluc, H. P. Karnthaler and M. J. Mills 137

Weak-beam TEM study of the h.c.p. to f.c.c. martensitic phase transformation lamellae in CoNi
By C. Hitzenberger and H. P. Karnthaler 151

Roughening of monoatomic growth steps in epitaxial gallium arsenide films
By U. Morlock and H. J. Queisser 165

Characterization of interfacial topography in lattice strained $In_xGa_{1-x}As/GaAs$ hetero-structures by the weak beam imaging technique
By J. Y. Yao, T. G. Andersson and G. L. Dunlop 173

Atom–atom collision cascades in non-uniformly stressed metals
By V. V. Kirsanov, S. B. Kislitsin and E. M. Kislitsina 201

PAGE

Some consequences of the elastic interaction of particles and free surfaces
By N. LOUAT and K. SADANANDA 213

The locking of ⟨112⟩/3 super-Shockley partials in $L1_2$ ordered γ′ single crystals deformed at 77 K
By Y. Q. SUN, M. A. CRIMP and P. M. HAZZLEDINE 223

A high-resolution electron microscopy study of secondary dislocations in $\Sigma=3$, $[\bar{1}10]$–$(\bar{1}\bar{1}1)$ grain boundaries of aluminium
By M. SHAMZUZZOHA, P. A. DEYMIER and D. J. SMITH 245

PART B

Correlation between gradients of composition and dielectric properties in oxynitride or diamond-like films on Si by means of spectroscopic ellipsometry and ion-beam analysis
By J. C. PIVIN, J. L. STEHLE, J. P. PIEL and M. ALLOUARD 1

Effect of conductive substrate on dissolution and lateral diffusion of metals in vitreous chalcogenides
By A. V. KOLOBOV and G. E. BEDEL'BAEVA 21

Relaxation processes and structural models in glassy chalcogenide materials: application to the $Se_{1-x}Ge_x$ alloys
By J. M. SAITER, A. ASSOU, J. GRENET and C. VAUTIER 33

Electrical conductivity and metal–insulator transition in the amorphous system Cr_xGe_{1-x}
By D. ELEFANT, C. GLADUN, A. HEINRICH, J. SCHUMANN and H. VINZELBERG 49

Electron microscopy study of the coherent two-phase mixtures $L1_0+L1_2$ in Co–Pt alloys
By C. LEROUX, A. LOISEAU, D. BRODDIN and G. VAN TENDELOO 57

Relationship between the correlation factor in tracer diffusion and the coordination number
By I. A. SZABÓ, M. KOIWA and S. ISHIOKA 83

Relation between the tangent of the angle of dielectric losses and low drift mobility in dielectrics
By V. V. BRYKSIN, A. V. GOLTSEV and S. D. KHANIN 91

Refractive index and absorption in boron-doped a-SiC : H using either diborane or trimethylboron as a doping gas
By M. GORN, P. LECHNER, H.-D. MOHRING, H. RÜBEL, B. SCHEPPAT and N. KNIFFLER 101

Observation of hydrogen trapping in a eutectic Al–Cu alloy by tritium electron microautoradiography
By H. SAITOH, Y. IIJIMA and K.-I. HIRANO 113

PAGE

The application of pseudo-potentials to the detailed analysis of positron lifetimes in helium bubbles contained in metals
By G. M. DUNN, P. RICE-EVANS and J. H. EVANS 119

NUMBER 2—AUGUST

PART A

Investigation of the atomic interface structure of mesotaxial Si/$CoSi_2$(100) layers formed by high-dose implantation
By C. W. T. BULLE-LIEUWMA, A. F. DE JONG and D. E. W. VANDENHOUDT 255

Disclination in an elastic sphere
By I. A. POLONSKY, A. E. ROMANOV, V. G. GRYAZNOV and A. M. KAPRELOV 281

The velocity of dislocations in ice
By C. SHEARWOOD and R. W. WHITWORTH 289

Five types of inversion twin in vapour-grown CdS needle crystals
By H. IWANAGA, A. TOMIZUKA, S. TAKEUCHI and T. YOSHIIE 303

The locking of ⟨110⟩ edge dislocations on {001} in $L1_2$ ordered compounds: high-resolution electron-microscopy observations
By Y. Q. SUN, P. M. HAZZLEDINE, M. A. CRIMP and A. COURET 311

Stacking faults in plastically deformed FeAl alloy with the B2 structure
By Z. Y. SONG, H. HASHIMOTO, C. T. CHOU and H. ENDOH 333

Computer simulation study of the Manning relations and related approximations in a strictly regular solution model
By A. R. ALLNATT and E. LOFTUS ALLNATT 341

Effect of neutron irradiation on the dislocation relaxation peak in single-crystal copper of ⟨110⟩ orientation
By W. E. ALNASER and M. ZEIN 355

Transmission electron microscopy characterization of interfacial boundaries in heat-treated Ti_3Al + TiAl two-phase alloy
By L. ZHAO and K. TANGRI 361

***In situ* observation of $\gamma \rightarrow \alpha$ transformation of Fe particles in a Cu–Fe alloy**
By N. ISHIKAWA and A. SATO 387

***In situ* deformation of proton-irradiated molybdenum in a high-voltage electron microscope**
By M. SUZUKI, A. FUJIMURA, A. SATO, J. NAGAKAWA, N. YAMAMOTO and H. SHIRAISHI 395

Quasicrystals and their crystalline homologues in the Al–Mn–Cu ternary alloys
By G. VAN TENDELOO, A. SINGH and S. RANGANATHAN 413

PAGE

The effect of lattice misfit on the dissolution kinetics of γ-Ag_2Al precipitates
By K. K. SAGOE-CRENTSIL and L. C. BROWN 429

Fractal analysis of crystalline surfaces at atomic resolution
By L. A. BURSILL, F. XUDONG and P. JULIN 443

The effect of the thermal fluctuations of a dislocation on the Cottrell atmosphere
By JUN NI and T. S. KE 465

Kinetics of long and short range order: comparison of simulations with theory
By R. VETTER and C. M. VAN BAAL 473

Structures of shear planes, intersection areas and translation domains in the Al_5CuLi_3 Frank–Kasper phase
By G. J. SHIFLET, Q. B. YANG, D. S. ZHOU and S. J. POON 483

Long-range internal stresses and asymmetric X-ray line-broadening in tensile-deformed [001]-oriented copper single crystals: the correction of an erratum
By T. UNGÁR, H. MUGHRABI, M. WILKENS and A. HILSCHER 495

PART B

Temperature dependence of the lattice parameter of the γ and γ' phases in the nickel-based superalloy CMSX-2. Part I: Observation of a tetragonal distortion of the γ' phase at high temperature by γ-ray diffractometry
By D. BELLET and P. BASTIE 135

Temperature dependence of the lattice parameter of the γ and γ' phases in the nickel-based superalloy CMSX-2. Part II: Neutron diffraction study of the lattice parameter mismatch
By D. BELLET and P. BASTIE 143

The low-field magnetic response of a re-entrant Ni Mn alloy
By H. KUNKEL, R. M. ROSHKO, W. RUAN and G. WILLIAMS 153

Structure breaking and electron localization in liquid cryolite–sodium solutions
By Z. AKDENIZ and M. P. TOSI 167

Single-crystal structural studies of metal-dichloride graphite intercalation compounds
By J. S. SPECK, J. T. NICHOLLS, B. J. WUENSCH, J. M. DELGADO, M. S. DRESSELHAUS and H. MIYAZAKI 181

Electrical conduction mechanisms in electrochemically formed amorphous films of Nb_2O_5
By G. JOUVE 207

Growth mode transitions in Si molecular beam epitaxy on (100) and (111) substrate surfaces
By A. ISHIZAKA 219

A.c. properties of semi-insulating InP
By J. J. MAREŠ, J. KRIŠTOFIK, V. ŠMÍD and J. ZEMAN 233

PAGE

An investigation of the phosphorus doping mechanism in a-Si by sweep-out experiments
By E. Z. Liu and W. E. Spear 245

Book reviews 263

NUMBER 3—SEPTEMBER

PART A

Model of early stage of dislocation structure formation in cyclically deformed metal crystals
By A. Franěk, R. Kalus and J. Kratochvíl 497

TEM study of combined oxygen and nitrogen implanted silicon
By A. De Veirman, J. Van Landuyt and W. Skorupa 513

Reflection electron microscopy observations of dislocations and dislocation motion in zinc oxide
By L.-M. Peng and J. T. Czernuszka 533

On long-range lattice perfection in natural type Ia diamond
By A. R. Lang, G. Kowalski, A. P. W. Makepeace and M. Moore 543

Interfacial phase transitions and bonding in the Cu/Al_2O_3 system
By S. Mellul and J.-P. Chevalier 561

Thermal and Huang diffuse scattering by shape-memory alloy martensites
By I. M. Robertson 577

Fabrication and electrical activity of twist boundaries in silicon
By G. C. Perreault, S. L. Hyland and D. G. Ast 587

Convergent beam electron diffraction studies of strain in Si/SiGe superlattices
By D. Cherns, R. Touaitia, A. R. Preston, C. J. Rossouw and D. C. Houghton 597

Relaxation phenomena in polycrystalline molybdenum at 10 MHz
By W. E. Alnaser and M. Zein 613

A note on the linear–parabolic law of phase formation
By S. L. Zhang and F. M. d'Heurle 619

The energy of an array of dislocations II. Consideration of a capped epitaxial layer
By J. R. Willis, S. C. Jain and R. Bullough 629

On the mechanism of shear of γ'-precipitates by single $(a/2)\langle 110\rangle$ dissociated matrix dislocations in Ni-based superalloys
By B. Décamps, A. J. Morton and M. Condat 641

PAGE

An *in situ* study of cube glide in the γ′-phase of a superalloy I. The controlling mechanism
By N. Clément, A. Couret and D. Caillard 669

An *in situ* study of cube glide in the γ′-phase of a superalloy II. The anomalous stress–temperature dependence
By N. Clément, G. Molénat and D. Caillard 697

Self-consistent kinetic theory and the Manning theory of matter transport in a random alloy
By A. R. Allnatt 709

The atomic structure of a [100], 45° twist plus 17·5° tilt grain boundary in aluminium by high-resolution electron microscopy
By M. Shamsuzzoha, D. J. Smith and P. A. Deymier 719

PART B

Non-reciprocal optical rotation in cubic antiferromagnets
By E. B. Graham and R. E. Raab 267

Ground-state structures in ordered binary h.c.p. alloys
By A. K. Singh and S. Lele 275

Calculation of some metallic-glass properties, based on the use of a Gaussian distribution for the nearest-neighbour distance III. Elastic constants
By G. Knuyt and L. M. Stals 299

Epitaxial growth of sputtered Al films on Si(001) substrates
By M. Kato and H. Niwa 317

One-dimensional hopping conductivity calculations
By A. Hunt 327

The dielectric relaxation of lead magnesium niobate relaxor ferroelectrics
By D. Viehland, S. Jang, L. E. Cross and M. Wuttig 335

A novel marker for the determination of transport numbers during anodic barrier oxide growth on aluminium
By K. Shimizu, K. Kobayashi, G. E. Thompson and G. C. Wood 345

Kinetics of optical reorientation in amorphous $GeSe_2$ films
By T. Kósa and I. Jánossy 355

Field-profile determination in amorphous Si–Ge alloy Schottky barriers
By J. P. Kleider, C. Longeaud, O. Glodt, D. Mencaraglia and R. Vanderhaghen 367

NUMBER 4 – OCTOBER

PART A

PAGE

Feature article: Vacancies and self-interstitials in zinc and cadmium
By A. SEEGER 735

High temperature creep of $Fe_{1-x}O$
By E. JOLLES and C. MONTY 765

Correlation effects in atom transport by the interstitialcy mechanism
By A. R. ALLNATT and E. L. ALLNATT 777

Experimental and crystallographic evidence for the growth of two equivalent β-variants from one single martensite plate in a Cu–Zn–Al single crystal
By F. C. LOVEY, A. AMENGUAL and V. TORRA 787

Formation of B2 antiphase domains in rapidly solidified Fe–Al alloys
By U. PRAKASH, R. A. BUCKLEY and H. JONES 797

On the effect of deviation from stoichiometry on the deformation microstructure of binary Ni_3Al
By J. DOUIN and P. VEYSSIÈRE 807

On the determination of the Burgers vector of quasicrystal dislocations by transmission electron microscopy
By M. WOLLGARTEN, D. GRATIAS, Z. ZHANG and K. URBAN 819

Anelastic relaxation and internal strain in lead magnesium niobate relaxors
By D. VIEHLAND, S. J. JANG, E. CROSS and M. WUTTIG 835

Crack propagation in b.c.c. crystals studied with a combined finite-element and atomistic model
By S. KOHLHOFF, P. GUMBSCH and H. F. FISCHMEISTER 851

The role of shear stresses and shear strains in transformation-toughening
By D. M. STUMP 879

Grain boundaries in extended-chain polymers: theory and experiment
By D. C. MARTIN and E. L. THOMAS 903

High-temperature plastic deformation in Y_2O_3-stabilized ZrO_2 single crystals: IV. The secondary slip systems
By A. DOMINGUEZ-RODRIGUEZ, D.-S. CHEONG and A. H. HEUER 923

The formation of dislocation loops at crack tips in three dimensions
By G. SCHOECK and W. PÜSCHL 931

Interaction between lattice dislocations and grain boundaries in f.c.c. and ordered compounds: a computer simulation
By B. J. PESTMAN, J. TH. M. DE HOSSON, V. VITEK and F. W. SCHAPINK 951

High-resolution electron microscopy observations of the layer structures and stacking faults in molybdenite crystals
By M. SHIOJIRI, T. ISSHIKI, S. ENOMOTO, E. KOBAYASHI and N. TAKAHASHI 971

PART B

PAGE

Photoelectrical properties of $AgInTe_2$
By R. SHUKLA, P. KHURANA and K. K. SRIVASTAVA 389

MAS NMR studies of ternary silicate glasses
By S. PRABAKAR and K. J. RAO 401

Real-space method for total-energy calculations in semiconductors: estimation of stacking fault energies
By A. GROSS and H. TEICHLER 413

Light scattering from defects in crystals: scattering by dislocations
By K. MORIYA 425

A scanning electrical resistivity (SER) study of phase transformations in an Al–Cu alloy
By G. RIONTINO and S. ABIS 447

Grain boundary states in germanium
By R. LABUSCH and J. LUEDECKE 463

Structural and electrical properties of AlCuFe quasicrystals
By V. SRINIVAS and R. A. DUNLAP 475

Epitaxy of Fe films on spherical Cu and Au substrates
By M. WADA, A. FUJII, T. YOSHIDA and M. KATO 485

Microscopic structure of doped borate glasses from molecular dynamics simulations
By M. C. ABRAMO, G. PIZZIMENTI and A. CONSOLO 495

A gauge model of amorphous solids containing defects. II. Chern–Simons free energy
By T. DERELI and A. VERÇIN 509

Thermodynamical equilibrium gap-state distribution in undoped a-Si:H
By G. SCHUMM and G. H. BAUER 515

Book reviews 529

NUMBER 5—NOVEMBER

PART A

Preface
By C. R. A. CATLOW 981

Electrical conductivity measurements of ionic solids
By A. V. CHADWICK 983

The effect of carbon monoxide and methane on the electrical conductivity of TiO_2 single crystals
By A. V. CHADWICK, R. M. GEATCHES and J. D. WRIGHT 999

PAGE

Atomic transport in heavily defective solids
By C. R. A. CATLOW 1011

Ion transport and relaxation studied by high-frequency conductivity and quasi-elastic neutron scattering
By K. FUNKE 1025

Point defects in the silver halides—what one learns from ion transport and surface potential
By L. SLIFKIN 1035

Defect properties and diffusion in silver halides
By A. L. LASKAR 1043

A structural basis for ionic diffusion in oxide glasses
By G. N. GREAVES, S. J. GURMAN, C. R. A. CATLOW, A. V. CHADWICK, S. HOUDE-WALTER, C. M. B. HENDERSON and B. R. DOBSON 1059

Ionic diffusion in polymer matrices
By J. CORISH 1073

Ionic transport in polymer electrolytes
By P. G. BRUCE, F. M. GRAY, J. SHI and C. A. VINCENT 1091

Intercalation compounds: some recent developments and future trends in mixed conductors
By P. G. BRUCE 1101

The mechanism of lithium ion mobility in solid electrolytes
By ISAAC ABRAHAMS 1115

Computer simulation of ion transport and hole centres in matlockite (PbFCl) structured phosphors
By M. S. ISLAM 1121

Oxygen ion migration in La_2CuO_4
By N. L. ALLAN and W. C. MACKRODT 1131

The effect of pressure on Schottky pair formation in MgO: a lattice dynamical approach
By D. R. MILLS, S. C. PARKER and A. WALL 1135

Molecular dynamics simulation of superionic conductors on an IBM/XT personal computer with transputer board
By W. ALDA and J. MOŚCIŃSKI 1147

Investigation of ionic transport in composites by nuclear magnetic resonance
By J. H. STRANGE, S. M. RAGEB and R. T. C. SLADE 1161

Tracer diffusion in alkali halides
By F. BÉNIÈRE and S. K. SEN 1169

Ion transport in ceramics
By HJ. MATZKE 1183

PART B

PAGE

Electronic properties of amorphous and microcrystalline silicon prepared in a microwave plasma from SiF_4
By A. C. HOURD, D. L. MELVILLE and W. E. SPEAR 533

Computer simulation of the quasicrystal growth and its transformation to crystal in $Mg_{32}(Al, Zn)_{49}$ alloy
By S. Q. WANG and H. Q. YE 551

Thermoelectric power of tellurium under pressure up to 8 GPa
By S. K. RAMASESHA and A. K. SINGH 559

The calorimetric glass transition. A simple model
By A. HUNT 563

The a.c. conductivity of variable range hopping systems such as amorphous semiconductors
By A. HUNT 579

Study of the Fermi level in disordered aluminium–manganese alloys by X-ray absorption spectroscopy
By S. D. DESHPANDE, P. R. SARODE and C. MANDE 591

Extended X-ray absorption fine-structure study of the local structure of quasicrystalline $Al_{65}Cu_{20}Co_{15}$ in the decagonal phase
By JUN DONG, KUNQUAN LU, HAI YANG and QIAO SHAN 599

Effect of hydrogen on disorder in amorphous silicon
By W. B. JACKSON, C. C. TSAI and C. DOLAND 611

Evidence for a single-stage Verwey-transition in perfect magnetite
By F. WALZ and H. KRONMÜLLER 623

High-order periodic approximants of a decagonal quasicrystal in $Al_{70}Ni_{15}Co_{15}$
By K. EDAGAWA, K. SUZUKI, M. ICHIHARA, S. TAKEUCHI and T. SHIBUYA 629

Local phonon spectra around a vacancy in copper
By G. TICHY 639

Book reviews 651

NUMBER 6—DECEMBER

PART A

Investigation of omega-phase in Ti–Mo alloys by high resolution electron microscopy, image processing and dark-field methods
By E. SUKEDAI, H. HASHIMOTO and M. TOMITA 1201

Amorphization, morphological instability and crystallization of krypton ion irradiated germanium
By L. M. WANG and R. C. BIRTCHER 1209

PAGE

Dislocations in bimaterials
By H. Y. Yu and S. C. Sanday 1225

A generalized model of grain boundary diffusion
By Yu. M. Mishin and I. V. Yurovitskii 1239

Prediction of deformation texture in polycrystals
By A. Morawiec, K. Wierzbanowski, J. Jura and A. Baczmański 1251

Tensile strength of short-fibre-reinforced brittle materials with pre-existing defects
By Xiao-Zhi Hu, Yiu-Wing Mai and Brian Cotterell..... 1265

Direct observation of the shear APB interface in Fe_3Al by HREM
By D. Shindo, M. H. Yoo, S. Hanada and K. Hiraga..... 1281

Dislocation mechanisms in Ni_3Al at room temperature. *In situ* straining experiments in TEM
By G. Molenat and D. Caillard..... 1291

A study of grain boundary statistics in 304 and 316L stainless steels
By V. Yu. Gertsman and K. Tangri..... 1319

Significance of longitudinal and transversal size effects on the statistics of fibre strength
By V. M. Karbhari and D. J. Wilkins..... 1331

Some observations on slip in niobium and Nb–Ti alloy deformed *in situ* in a HVEM
By G. Taylor and H. Saka..... 1345

A perturbation solution for ternary diffusion with a variable diffusivity matrix
By J. J. Hoyt..... 1355

PART B

A study of the properties of hydrogenated amorphous germanium produced by r.f. glow discharge as the electrode gap is varied: the link between microstructure and optoelectronic properties
By P. Wickboldt, S. J. Jones, F. C. Marques, D. Pang, W. A. Turner, A. E. Wetsel, W. Paul and J. H. Chen 655

Temperature dependence of steady-state photoconductivity in hydrogenated amorphous silicon
By T. Smaïl and T. Mohammed-Brahim 675

Thermally induced metastability in compensated and delta-doped amorphous silicon
By Kyung-Sook Hyun, Choochon Lee, K. J. Chang and Jin Jang 689

Precipitation in melt-spun Al-based binary alloys with transition metals
By X. D. Zhang and M. H. Loretto..... 697

PAGE

Dielectric relaxation in hollandites and rutile
By R. W. CHEARY and J. S. DRYDEN 709

Determination of the energy band diagram for a-$Si_{1-x}Y_x$:H/c-Si (Y ≡ C or Ge) heterojunctions: analysis of transport properties
By M. CUNIOT and N. LEQUEUX 723

Magnetic and electrical properties of UCu_2Ge_2
By S. B. ROY and B. R. COLES 741

On diffusion-controlled evolution of closed solid-state thermodynamic systems at constant temperature and pressure
By J. SVOBODA and I. TUREK 749

Magnetic excitations in high-T_c superconductors
By A. A. GOLUB, V. V. KABANOV and O. YU. MASHTAKOV 761

Book reviews 769

Subject index 775

Index of authors 783